

# MARCH 1995 NSLS NEWSLETTER

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## Chairman's Introduction

Denis McWhan

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On January 1st, I became Associate Director for the Basic Energy Sciences Programs at Brookhaven National Laboratory, but I will continue to serve as Acting NSLS Chairman until a new Chairperson is appointed. A search committee composed of John Axe (BNL, Chairman), Ilan Ben-Zvi (NSLS), Bob Birgeneau (MIT), Wayne Hendrikson (HMML/Columbia), Erik Johnson (NSLS), Dave Shirley (Penn. State), Jean Jordan-Sweet (IBM/ UEC Chair.) and Sunil Sinha (EXXON) is hard at work coming up with a short list of candidates to give to BNL Director Nick Samios.

I was very fortunate to become Chairman after all the major problems had been solved, and it has been a glorious 5 years. The performance of the VUV and X-Ray Rings has been outstanding in terms of beam stability and reliability and the sheer number of hours of beam delivered to the users. The facility has continued to grow and to provide more services such as an efficient user registration and training process, electronic submission of abstracts, and various equipment pools. With the completion of the building expansions in the spring we will have achieved our goal of being able to provide every PRT with a set-up lab on the experimental floor and office space in surrounding buildings. The Friday lunch seminars have added to the intellectual environment of the NSLS, and their success is due to Chi-Chang Kao who manages to find two speakers every week and to my wife, Callie, who has baked dessert every week that we have been in town for the past five years. In the final analysis the strength of the facility rests on the dedication of the staff. Much of what is accomplished by the staff is not obvious to the casual visitor, but the degree of commitment is truly outstanding. With its facilities and its staff, the NSLS will continue to be a user friendly, cost-effective synchrotron source for the foreseeable future.

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## Beamline Confederations

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With this issue of the Newsletter we explore the evolution of the PRT system into confederations. The NSLS pioneered in the development of the PRT system, which led to the building of over 80 beamlines with a capital investment of well over \$100 million. This has brought together a large number of leading scientists from around the world. These scientists, both PRT members and General Users, have come to depend on the beamlines for major parts of their research programs, but the operation, maintenance and upgrading of each beamline are dependent on the funding success of a small subset of this group. The experience at the NSLS over the last 15 years has been that it is relatively easy to obtain the funds to build a beamline, but in hard economic times, obtaining adequate funds for yearly operations is far less certain. Just like any business it is essential to maximize the efficiency of the operation and thereby minimize the operating costs. If PRTs which make similar measurements can form confederations, then standardization of hardware and software would lead to more efficient and therefore less costly maintenance and operations. At the same time the NSLS would expand its user support group to provide both scientific and technical support for each confederation. The user community, as a result, would also benefit from the confederations by having access to enhanced services. Examples of possible confederations are the beamlines which specialize in absorption spectroscopy, structural biology, and powder diffraction. They are principally flux not brightness limited experiments and the NSLS has a large number of beamlines in each area. In the following articles these areas are reviewed in terms of available resources and capabilities and recent highlights. We welcome suggestions from the user community on the evolution of the PRT system.

[Absorption Spectroscopy](#)

[Structural Biology](#)

[Powder Diffraction](#)

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## Elliptically Polarized Wiggler (EPW)

Sam Krinsky, NSLS Deputy Chairman

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During the Fall'94 shutdown, the Elliptically Polarized Wiggler (EPW) was installed in the X13 straight section of the [X-Ray Ring](#). The EPW produces variable polarized x-rays with right/left-handedness of polarization switchable at up to 100 Hz. The development of this device is a collaboration among the NSLS, the APS, and the BINP of Novosibirsk, Russia. The vertical wiggler magnetic field is produced by a permanent magnet hybrid structure, while the horizontal wiggler magnetic field is generated by an electromagnet capable of AC operation. The basic magnet structure of the EPW is that developed at the Photon Factory ([KEK, Japan](#)). Here, the technology has been extended to provide a switchable elliptically polarized wiggler, which will make possible the use of lock-in amplifier techniques to detect the very weak signatures of circular dichroism and other effects associated with right- vs. left-handedness of some physical systems.

Over the last month, initial machine physics studies have confirmed the excellent compensation of the first and second field integrals of the electromagnet achieved during magnetic measurement at Argonne. Utilizing the very high precision orbit measurement system on the X-Ray Ring, the ongoing work is aimed at reducing the orbit motion observed during 2 Hz and 100 Hz operation of the EPW below the ambient background. This is accomplished using correction coils at each end of the wiggler. Results achieved thus far are very positive. In March, the output of the EPW will be observed on the X13 beamline, and measurements will be carried out to determine the characteristics of the emitted radiation.

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## A User's Perspective

Jean Jordan-Sweet (IBM), UEC Chair

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We are teetering on the brink of change at many levels here at the NSLS. I feel as if I've just stepped off of an IBM rollercoaster ride only to be swept back up by the NSLS/BNL/DOE/Washington rollercoaster! I'd like to use this column to give you a "user's" view on three of these areas of upcoming change: the NSLS Chairmanship, the PRT system, and the role of the National Labs as seen by the Galvin Committee.

The UEC discussed the search for a new NSLS Chairman at our January 29 meeting. We feel that in this era of

tightening budgets and new third-generation synchrotrons coming on line, our greatest needs are the pursuit of adequate funding for the NSLS and the retention of our user base. The new Chairman must strive to obtain sufficient funding for operations, maintenance, upgrades, R&D, and some user support. At the same time, much effort must be put into halting the loss of important users to other synchrotrons, which lure them away with offers of better support and services. The great majority of experiments are not brightness-limited, and many will still be performed here provided that the NSLS has an infrastructure that is competitive with those of the newer synchrotron facilities.

It is inevitable that some PRTs will fold or move on, and that some General Users will migrate to the third-generation sources, but this attrition can provide the NSLS with an opportunity to renew itself. There are many potential synchrotron users out there. We hope that the new Chairman will find a creative way to access this untapped market. (More about this in the next paragraph...) In short, what we want is a Chairman who has faith in the future of the NSLS, who is respected and well-known in both the synchrotron community and in Washington, who will put creative energy into a market-driven evolution of the PRT system, who will bolster the NSLS infrastructure, and who will serve as a symbol to the rest of the world that the NSLS is a thriving facility and will remain so in the future.

The UEC had an interesting discussion with Denis McWhan and Jerry Hastings about the future of the NSLS PRT system. Their view of the future is that there will be an increase in demand for user-friendly, fast-turnaround, advanced- capability beamlines for such things as powder diffraction, absorption spectroscopy, structural biology, imaging, etc. Such facilities require extensive staffing and upkeep. It was proposed that consortia could be formed among beamlines and users employing a common technique. Instrumentation and data-acquisition software could be standardized and there would be a common pool of support staff. Users would be able to walk away from these beamlines with, say, a solved structure rather than a bunch of raw data. There would be a real efficiency of scale, and the NSLS could, in fact, pitch in with support staff.

It sounds like an ideal situation, but the road to get there could be mighty rocky. The UEC feels that groups' getting together to form "super-PRTs" would be beneficial, provided they are self-driven. It is inevitable that, to some extent, the need to pool resources will force this; the provision of technical, secretarial or computing help by the NSLS would be most welcome. We can see that techniques such as protein crystallography, EXAFS, and powder diffraction lend themselves well to some amount of standardization, and that the crystallographic and the EXAFS communities are both aware of the need to do something along this line very soon. The NSLS must be very careful not to force this style of organization on anyone, but should stand at the ready to aid the evolution towards cooperatives through staff support and education.

Strong PRTs should certainly be encouraged to continue along their own paths or perhaps only to share a common pool of technical and administrative support while maintaining the uniqueness of each beamline. This new structure opens up all kinds of interesting questions about cost-recovery, General User support, etc. We should all spend some time contemplating this, because it looks like the way things will go.

The Galvin Committee Report is available through the WWW, on the NSLS Home Page under "News and Announcements" and on the BNL Home Page under "Of Note". This report is quite interesting, especially Section VII: The Governance and Organization Issue, and Appendix A: Excessive Oversight and Micromanaging. This Committee recognizes the value of the National Labs and their "missions". It lambastes the DOE for years of progressively increased micromanagement and levels of requirements "...in excess of Federal, state and local regulations..." (Ring a bell?) It boldly proposes a new management scheme where the government becomes the "customer" of the National Labs, and leaves the internal workings to the labs and their "corporate" boards of trustees.

Recognizing that this radical idea is not likely to be welcomed with open arms, the Committee also made

recommendations it deemed necessary for the survival of the National Labs, should they remain Government Owned/Contractor Operated (GOCO). These are listed in Appendix B and include basing DOE oversight on performance rather than process, eliminating DOE self-regulation (allowing the Labs to follow industry-wide regulatory standards), consolidating DOE oversight offices, instituting a multiyear, standardized budget process, rebuilding the Labs' infrastructures, and challenging the Labs to reduce costs. The elimination of hundreds of audits, compliance paperwork, etc. would save the Labs untold amounts of money. Unfortunately, Secretary O'Leary's response (also on the NSLS Home Page) played this down, and instead latched onto the idea of the Labs concentrating on their "established areas of excellence" and paring down everything else to meet with the projected \$10.6 billion DOE budget decrease over the next five years.

Rather than to report on the last Town Meeting and UEC Meeting (held on January 26 and 27), I'd like to hand over the rest of this page to Paul Zschack, who will tell you about the Annual Users' Meeting and Workshops. The UEC has a link on the NSLS Home Page, and I will write up a brief report on the meetings and post it there.

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## 1995 Annual Users' Meeting

Paul Zschack (ORNL), Chairman of the 1995 Organizing Committee

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Planning for the [1995 Annual Users' Meeting](#) is well underway. This year, the meeting will be held Tuesday and Wednesday, May 9-10 here at BNL. As in past years, a full day of workshop activity is scheduled for the day preceding the meeting. In addition, a satellite EXAFS workshop will be held on Sunday, May 7 to allow members of the EXAFS community to gather and discuss issues of particular interest to EXAFS Users and still have the opportunity to participate in the other workshops.

Our User community has grown to over 2700 active NSLS appointments, and the Annual Meeting provides occasion to interact, network, and share our results and experiences with a broad scientific population. In this time of uncertain future, this year's Meeting takes on additional significance. The new directions that the NSLS will need to pursue and the role of the PRTs are clearly areas that need attention. The Meeting provides a timely forum to question the planning of the NSLS management and to informally discuss these concepts with other members of the User community. A Keynote session is planned for Tuesday morning and will include political insight as well as reflection on the 100th anniversary of Roetgen's discovery.

As this is our 14th Annual Meeting, we realize the maturity of the User community, and it is natural to recognize the scientific output at the NSLS. Indeed the Light Source is an impressive and highly productive facility. As the NSLS continues to provide improved operations, Users have taken advantage of improved emittance, orbit stability, longer lifetimes, and faster, more reliable injections. The planned scientific agenda will reflect the diversity of the scientific missions of our community, and demonstrate the broad scientific output of our Users. Similarly, the philosophy that surrounds the workshop program is to emphasize the scientific contributions Light Source Users have made in various disciplines. A full day of informative seminars is planned in addition to the special satellite EXAFS workshop.

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## [Satellite Workshop: Sunday May 7, 1995](#)

The Future of EXAFS, organized by David Adler (516) 282-2686

## [Workshops on Monday May 8, 1995](#)

### [Synchrotron Infrared Science](#)

Larry Carr (516) 346-9073

### [Advances in the Characterization of Buried Interfaces Using Synchrotron Radiation](#)

Benjamin M. DeKoven (517) 636-0221

[Powder Diffraction Using Synchrotron Radiation](#)

Peter Stephens (516) 632-8156

[Recent Advances in the Application of Synchrotron Radiation to Catalysis](#)

Simon R. Bare (517) 636-0351

[Medical/Biological Applications Using Synchrotron Radiation](#)

Xiaodong Zhang (516) 282-4723

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On the social agenda, a buffet dinner is planned following the workshops. Also, the [Conference Banquet](#) will be Tuesday evening at the Port Jefferson Country Club at Harbor Hills. This wonderful facility provides a magnificent view across the Sound to Connecticut and promises a relaxing social evening.

Finally, the Annual Meeting also provides the mechanism to elect the new members to the UEC. This year, an excellent slate of candidates has been assembled:

## [UEC Nominations](#)

- Dave Mullins, ORNL
- Doon Gibbs, BNL-Physics
- Kim Mohanty, Exxon Research & Engr.
- Yves Idzerda, NRL
- Joseph I. Budnick, U. of CT
- Peter Stephens, SUNY@Stony Brook

I urge good citizenship and hope for unprecedented voter turnout.

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## NSLS In the News

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### NSLS Chairman Named BNL Associate Director

On January 1, 1995, NSLS Chairman Denis McWhan became Associate Director for Basic Energy Sciences at BNL. In addition to direct responsibility for three departments - Applied Science (DAS), Chemistry, and the NSLS - he oversees other BES programs at the Lab. Denis has been chairman of the NSLS since 1990 and will serve as Acting Chairman until the Search Committee finds a replacement. Jean Jordan-Sweet, Chair of the NSLS Users' Executive Committee, represents the users' interests on the Search Committee.

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### NSLS Deputy Chairman Receives BNL Award



Last December, Sam Krinsky was awarded the Laboratory's 1994 Distinguished Research and Development Award for his contributions to making the NSLS the leading synchrotron source in the world. His work includes: research and design aimed at improving the brightness of the [X-Ray Ring](#); the design and development of new insertion devices; theory and construction of a free electron laser. The Distinguished R&D Award is the highest of honors in the BNL Employee Awards Program, and recognizes notable contributions to the Laboratory's research and development mission.

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Ilan Ben-Zvi has been elected a Fellow of the American Physical Society. He joins Denis McWhan, Sam Krinsky, Jerry Hastings, and Arie van Steenberg in this honor.

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## Integrity - A Good Thing!

William Thomlinson, NSLS Associate Chairman Programs and ES&H

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It is very easy for all of us to get so immersed in our science and our struggles to keep on top of the regulatory requirements of life at a complex user facility that we lose sight of the most basic principles of safety. Thus, every now and then we get reminded of the need to go back to basics. One such issue arose recently with regard to hutch shielding on our x-ray floor. It was discovered that one hutch had been constructed many years ago with a roof panel which could be moved to allow crane or cryogenic equipment access. That is certainly allowed, but this particular panel was not controlled under any NSLS configuration control program. That, needless to say, is not allowed. My first use of integrity is therefore the absolute need to maintain the "integrity" of the shielding and/or barriers preventing anyone from accessing a radiation area, or from being exposed to radiation from a radiation area.

In this case, there was no real hazard due to the location of the opening and the administrative control by the PRT whenever access had occurred (very infrequently). However, the fact that this situation was known about and not reported to the NSLS safety staff presents us with a real problem. The problem is one of integrity of the personnel with respect to the very basic, common sense need to make our staff aware of such situations so that we can design the proper control. I am not in the slightest implying that there was any overt intent to bypass the NSLS rules. In fact, I know that is not true. However, the personnel were trained, had experience at the NSLS, and yet failed to perceive the situation as one of potential hazard and one which violated our rules for configuration control.

We have taken several actions beyond resolving the issue with the PRT and putting in place a configuration control device. This Newsletter article is just one way in which we will be concentrating on informing the NSLS Community of the absolute need to maintain the integrity of their radiation enclosures and to always discuss perceived weaknesses or errors in our safety systems and programs with NSLS safety staff personnel. We will also be discussing these issues at the weekly meetings. I should not have to remind anyone that safety is everyone's business and we always react positively to information or questions concerning such issues. That is an integral part of the training which everyone receives, and in fact is just common sense.

On our part, we have undertaken a program to review the physical integrity of every radiation enclosure on the floor. In fact, that has probably been completed by the time you read this. The hutch in question was constructed and reviewed many years ago. Such a design would not be approved under today's review process, but we must become even more vigilant with respect to the historical situation.

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## Electronic Submission System (ESS)

Peggy Sutherland, NSLS

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The National Synchrotron Light Source has developed an electronic publishing system that represents a major innovation across several lines: using Mosaic's newest tools and custom-developed code for accepting and formatting data, authors can provide their Activity Report submissions electronically and obtain a formatted copy of their submission in minutes. This system will make submissions accessible on the Web at least two months before the print product is available.

The NSLS system was developed in response to several issues: (1) increasing demand for distribution of research on the Wide World Web, (2) increasing demand for other electronic products, and (3) increasing administrative efforts associated with author-supplied camera-ready copy that did not improve the appearance of the print product.

Market research was conducted last year, in order to effectively define the author needs and project scope: data from a user questionnaire was used to project the feasibility of the various alternative authoring tools. The decision to use Mosaic's new facility, the Forms Function, was based in part on the large proportion of users with Internet access/experience, the large variation in platforms/software used for word processing in the community, and the anticipated ease of Web distribution.

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## SOME HIGHLIGHTS OF THE ESS

- Innovatively uses Mosaic's Forms Function as a user-friendly, "template"-type, authoring tool.
- Creates SGML, HTML, TeX, and PostScript versions of each submission. These represent standard data formats associated with CD ROM software, Mosaic, technical notation in ASCII, and page description, respectively.
- Creates database records for each submission, thus giving flexibility in defining specialized products (through indexing, sorting, etc.).

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More than 70 users volunteered to beta test the ESS. Those who did participate as beta testers were relentless in their efforts, and provided invaluable suggestions for software modifications and documentation changes. Their feedback will provide the basis for a user bulletin board for the 1995 Activity Report.

As with any systems development project, the ESS faced some tough challenges. (1) A tight schedule for development of such a cutting edge project. (2) Optimal integration of figures and text, while meeting one-page length restrictions. (3) File version control; that is, allowing unrestricted author access to edit submissions, yet ensuring proper version of submission is used. Also, this year, enabling authors who originally submitted conventionally to resubmit electronically. (4) Security. (5) Platform limitations, described below.

The authors were impacted this year by platform limitations that we do not expect to see next year. Because the Forms Function was such a new facility for Mosaic, there were some platforms (notably the PC and Macs) that did not have full support for Mosaic. The NCSA, responsible for maintenance and upgrades of Mosaic, has since released a Mosaic upgrade for PCs. We expect that our testing will prove this new release has

resolved the problems PC users had with the Forms Function. For the Mac user, Netscape, a commercial product licensed for Mosaic on the Mac, has proven more effective in using the Forms Function. We hope that the NCSA will upgrade their public domain Mosaic for Mac users as well. The response from participating authors has been overwhelmingly positive and supportive of the NSLS' efforts to provide authors with a direct link to the publication process and take advantage of the incredible distribution possibilities offered to the researcher by Mosaic and the World Wide Web.

The Electronic Submission System for the NSLS can be accessed through the [NSLS Home Page](#) on the World Wide Web. A [demonstration submission](#) will be accessible year-round, without update privileges. Full documentation is available for viewing and/or downloading in PostScript format.

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## NSLS Home Page on the World Wide Web

Eva Z. Rothman, NSLS User Administrator

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The [NSLS Home Page](#) on the World Wide Web went public on February 1, 1995. The Web allows round-the-clock, around-the-world access to information about the NSLS so that researchers can get what they need, precisely when they need it. This Home Page, along with the NSLS Newsletter, serves as the primary means of informing users and the broader research community about projects, plans, and developments at the NSLS. This two-pronged approach keeps the dissemination of information timely and cost-effective, while reaching those who prefer the written as well as the electronic word.

Several [beamlines](#) have been working on their own Home Pages, with information such as user schedules, research highlights, etc. The NSLS will be putting up one screen for each beamline, essentially the summary information found for each beamline in the *NSLS Users' Manual: Guide to the NSLS Beamlines*. For this purpose, the beamlines were asked to send in their User Manual page marked up with changes/updates as part of the SAC Report.

To access the NSLS Home Page, run a Web browser such as Mosaic. Select "Open URL" from the File menu, and enter: <http://www.nsls.bnl.gov> (or, click [here](#)).

The NSLS can also be accessed via the [BNL Home Page](#), and from other synchrotron pages on the Web.

Please contact Eva Rothman (at 516-282-7114, or [ezr@bnl.gov](mailto:ezr@bnl.gov)) with questions and suggestions, as well as requests for linking to the NSLS pages. If you are just getting started with Web documents, there is help available.

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## ISD: BNL's "Information Central"

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As of February 1, 1995, the Photography and Graphics Arts Department and the Technical Information Division (TID) became a single entity called the [Information Services Division \(ISD\)](#). The new organization's mission is to provide services centered on creating, storing, retrieving and distributing information, and to increase the value of the information being handled. With the computing strength and experience of the two combined divisions, ISD continues to serve as a test site for new software and plans on becoming even more active in database support. Among other projects, ISD is creating an electronic and interactive BNL phone book, exploring new technologies such as publishing on CD ROM, and maintains the official [BNL Home Page](#) on the World Wide Web.

Diane Mirvis, who has headed the TID since 1988, was appointed Manager of ISD, and John Laurie, who has managed Photography and Graphic Arts since 1980, is the new division's Assistant Manager.

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## X-Ray Ring Update

Norman Fewell, [X-Ray Ring](#) Manager

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The X-Ray Ring is back in an operational mode after the long Fall'94 shutdown. The major maintenance activities undertaken during the shutdown were:

- upgrade of the magnet water cooling system
- hookup of the chilled water system to the central chilled water plant
- replacement of the booster extraction kicker
- upgrade of the booster power supplies
- installation of two new linac klystron modulators and one new klystron

In the X-Ray Ring, the prototype small gap undulator was removed from the X13 straight section and will be reworked to obtain a minimum vacuum gap of about 1.0 mm. This device will be reinstalled during a short shutdown in May, and exploration of how small an operational gap can be, will continue. Installation of the Elliptically Polarized Wiggler (EPW) was completed and performance tests are now being carried out during scheduled study periods.

Rework of the X17 beamline included the installation of a new "short transport enclosure safety shutter" system (STRESS). During its commissioning a vacuum failure of a misaligned spool-piece highlighted the necessity of an active interlock protection system for the insertion device chambers.

In anticipation of operating the ring at higher currents, active interlock systems have been installed for the insertion devices at X1 and X13. These systems are now being tested and calibrated.

The methods and results of the vacuum chamber task force on defining the thermal limits of the X-Ray Ring chambers have recently been reviewed by an outside review group. The review group concluded that the task force methods were sound and that the majority of the chamber components can withstand radiation powers associated with operating the X-Ray Ring at 500mA. However there are a variety of different beryllium windows used on the beamlines, some of which may not withstand radiation levels much above the present 250mA. A survey is now taking place to determine what type of window each beamline has and what operating level it will withstand. Hopefully the window problems will be resolved before the next operating cycle and we can commence running at about 350mA levels.

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## VUV Ring: Power Line Protection

Richard Heese, NSLS Operations Head

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The threat of thunderstorms in the Long Island area during the summer months always fill the Control Room operators with trepidation - a "LILCO power glitch" will cause the storage rings to dump, usually tripping off several main magnet supplies and the RF systems. More than 95% of the glitches are barely perceptible to the eye as a brief flicker of the electric lights; however, one or two missing powerline cycles, a drop in voltage of 10% for less than a second, or phase jitter on the three phase power due to switching transients caused by lightning strikes anywhere on the power grid within 50 miles will cause the NSLS power supplies to lose regulation momentarily or cause the heavily loaded RF supplies to drop in voltage, and the beam is lost. Analysis of unscheduled downtime for the last two years shows that 25% of this is due to "power glitches". The percentage is much higher if only the summer months are counted.

In the past, isolation from powerline disturbances was accomplished by motor-generator sets where the angular momentum stored in a flywheel was used to "fill in" a few missing cycles, or by large banks of batteries and DC-to-AC inverters. These systems are cumbersome at the power levels we require and are expensive to maintain. Although the need was there for such a system, it was not seriously considered. Recently, however, a new concept came on the market based on stored energy in a superconducting solenoid and new developments in power thyristors used in the inverter. A solenoid with inverter, switchgear, and connectors, and the requisite control system can be crammed into a standard trailer such as is seen on the highways every day. The unit can support a power level of up to 1.4 MW for up to 1 second; the power level is limited by the inverter - it is anticipated that inverters capable of handling up to 10 MW will be available in the near future.

The NSLS has acquired such a unit from the U.S. Air Force, who were looking for places to test these devices. The VUV Ring, which runs at a power level of 700 kW to 800 kW, was chosen as a logical load for the unit, and its beam dump rate will be compared to that of the X-Ray Ring for at least the next year. After the test time, the unit will remain as a permanent installation with the NSLS, and we will make a decision as to whether to place the entire facility on the SMES (Superconducting Magnet Energy Storage) system. The NSLS consumes up to 4MW, and it would be advantageous to do the switching at 13.8 kV, the primary feeder voltage, instead of at 480 V downstream of the substations. Further developments in the inverter technology would be required for this.

The unit we have acquired is built by Superconductivity Inc. of Madison, Wisconsin, and it passed its acceptance test at the factory on February 2, 1995. In addition to behaving predictably through all conceivable unusual powerline situations, it kept power running in a 500 KVA load for 3.5 seconds and sustained a 1200 KVA load for 1.25 seconds as part of its acceptance test. It will thus be able to handle at least a 2 second power outage of the VUV Ring and all its ancillary components.

The users of the VUV Ring will be entirely unaffected by this installation. The unit only cuts in when a

disturbance in the AC power is detected, and any problems with the unit or its scheduled maintenance will not disturb the normal AC flow to the ring. The only effect will be beneficial in that the VUV Ring will be more able to ride out "LILCO glitches" which normally would have dumped the beam, providing even more reliable performance than its usual high standards.

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# MARCH 1995 NSLS NEWSLETTER

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## Facility Report

Mike Kelly, NSLS Building Manager

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Construction is moving at a hurried pace to make the deadline of March 10, 1995. At this date, there are three weeks to go and the status is as follows:

The sprinkler system is installed. The smoke detectors are installed as well, but require termination into the NSLS fire detecting system. These are two key systems that must be operational before beneficial occupancy can occur.

In the structural biology addition, the laboratory flooring, sheet vinyl, and the lab furniture are being installed. The fume hoods are next in line and require two more roof penetrations. The penetrations will occur over the aisle and should cause minimal disruption to operations.

The HVAC piping is complete and the air-handler is being tied into the building. The windows have been installed and most of the painting is done. Electrical lighting is finished in the Control Room through X1-X4 expansion. In the structural biology expansion, lighting fixtures are currently being installed. Electrical receptacles have yet to be installed.

The Control Room computer floor is installed, and cabinetry is being attached to the walls.

At the completion of this contract, Plant Engineering will oversee the building of the X1A, X2, and X4 laboratories. This was not arranged under the existing contract because the price was far more than the budgeted amount. The work will be done under Basic Order Agreements (BOAs), which are small construction contracts, and will start as soon as building occupancy is established.

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# MARCH 1995 NSLS NEWSLETTER

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## CALL FOR GENERAL USER PROPOSALS

Deadline for proposals and requests for beam time on the [NSLS X-Ray and VUV Rings](#) is Wednesday, May 31, 1995 for scheduling September through December 1995

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### Prior to Submitting a Proposal

You must contact the beamline personnel responsible for the beamline(s) selected in order to verify technical feasibility on the beamline(s) and discuss any special arrangements for equipment. Your chance of getting beam time is improved by being able to use more than one beamline.

### Preparing Your Proposal

The same form is used for new proposals and for beam time requests against existing proposals. Follow the instructions on the proposal information sheet. All information must be typed or printed legibly. Be sure all of the required sections are completed and submitted at the same time. MAIL OR FAX ONE COPY of the [proposal form](#), [Safety Approval Form](#), and any attachments to the NSLS User Administration Office. Only one copy is required - do not mail a hard copy or fax a second if you have already faxed one.

### Proposal Deadline

The complete proposal package must be received by the User Administration Office on or before 5:00 pm Eastern Time Wednesday, May 31 in order to be considered for the September - December cycle. The fax machine is always extremely busy on the deadline date; please do not rely on faxing the proposal successfully on May 31. We encourage submitting new proposals by mail prior to the deadline. Beam time requests for active proposals will be accepted after the deadline, but will be allocated beam time only after requests received on time have been allocated. Late requests are not eligible for a rating upgrade if beam time could not be allocated to them.

Each proposal will receive a prompt preliminary review to verify that it is complete and legible. If there is a problem with the proposal, you will be contacted immediately. Submitting your proposal well in advance of the deadline date assures that the User Administration Office has time to reach you and that you will have enough time to correct any deficiencies.

### Additional Information and Forms

Blank [proposal forms and instructions](#), a guide to the NSLS beamlines, and more information about the [General User Program](#) are available by contacting the [General User Program Coordinator](#). Office hours are Monday through Friday, 8:00 am to 5:00 pm Eastern Time.

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# MARCH 1995 NSLS NEWSLETTER

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## Inelastic Scattering Beamline X21 Begins General User Program

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Effective May 1995, the inelastic scattering beamline X21 will start its General User Program. The research program at the X21 beamline is focussed on the study of electronic excitations in condensed matter. Initial experiments ranging from non-resonant Raman scattering, resonant Raman scattering, to high resolution Compton scattering, have been conducted by the Insertion Device Team. The radiation source of the beamline is a 27 pole hybrid wiggler. In the present configuration, the beamline consists of a focussing Rowland circle monochromator and a high resolution backscattering spectrometer. A schematic of the beamline is shown in the diagram below.



To obtain more details, please contact:

Dr. Chi-Chang Kao  
X21 Spokesperson and Local Contact  
NSLS, Building 725D  
Brookhaven National Laboratory  
Upton, NY 11973-5000  
Fax: (516) 282-3238  
Internet email address: kao@bnl.gov

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# MARCH 1995 NSLS NEWSLETTER

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## EXAFS EQUIPMENT POOL

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The NSLS EXAFS Equipment Pool offers the following equipment for borrowing by all users of the facility:

- Metal Foils: Co, Cu, Cr, Fe, Mn, Ni, Ti, V, Zn
- Liquid Nitrogen Cooled Dewar with Sample holder
- Lytle Detector with Electron Yield Detector and Hot/Cold Sample Holder
- Fluorescent Filters: As, Br, Co, Cu, Cr, Ga, Ge, Fe, Mn, Mo, Ni, Se, Ti, Y, Zn, and Zr
- Displex Closed Cycle He Refrigeration System
- EG&G Ortec Model SLP 16220-P Pop Top SiLi Detector

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For information contact Lars Furenlid 516-282-5699 or furenlid@bnlux1.bnl.gov

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## End-of-Run Summary

Please remember to fill out and turn in your end-of-run summary form; the NSLS needs feedback on how well we are answering user needs during your experimental runs. Comments, both positive and negative, and suggestions are encouraged!

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# MARCH 1995 NSLS NEWSLETTER

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## MICRO BUNCHES

A Workshop on the Production, Measurement & Applications of Short Bunches of Electrons and Positrons in Linacs & Storage Rings

Topics of Interest for the Workshop Include:

- Production of Short Bunches
- Impedance, Collective Effects and Feedback
- Diagnostics and Measurements
- Uses in Factories, FELs, Colliders and Coherent Emission

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Sponsored by the NSLS at Brookhaven National Laboratory, currently planned for October 1995

The workshop format includes both invited and contributed papers and working papers.

[Registration and Information](#) are via the World Wide Web, or by contacting Toni Hoffman / Kathy Loverro at (516) 282-5257 FAX (516) 282-3029

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# MARCH 1995 NSLS NEWSLETTER

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## Publication Lists and Abstracts: User Contributions to the Activity Report

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Experimental summaries, or abstracts, are collected every year for publication in the NSLS Activity Report. These abstracts make the Activity Report a truly useful publication and demonstrate the high level of scientific activity taking place here. Participants in the General User Program, as well as PRTs and their collaborators, have an obligation to report their work to the NSLS so that it may be disseminated to the scientific community. In addition, the Activity Report is one of the important tools the NSLS has for generating support for its continued funding.

With the development of the [Electronic Submission System \(ESS\)](#), the NSLS has committed to a program of electronic publishing to create more versatile and useful publications while cutting production costs. Instead of accepting paper copies in the mail, the NSLS will now require all abstracts to be submitted via the ESS. Unlike previous years, where the abstracts were collected for a period of two or three months, the electronically submitted abstracts can be submitted year round. Reminders will appear in the NSLS Newsletter.

Using the ESS to submit your abstract is easier than you might think - you can cut and paste your text right in! Simply use your favorite word processor to output an ASCII file and cut and paste it into the abstract Form. Please note that you still need to convert any math or Greek characters according to the instructions. (The Greek letter mu becomes  $\mu$ , for example.) Having trouble? Leave a short note to the production staff in the "Comments" field. Your figures should be made into Encapsulated PostScript (EPS) files and FTPd to the ESS system. The composition tools include macros which automatically size and place the figures - you can see exactly what your abstract will look like immediately! Complete instructions are on the Web for either viewing or printing.

Another important piece of information that the NSLS needs is the list of your publications arising from work performed at the NSLS. Please include names of all authors, title, journal/proceedings/book/thesis, volume, page, and year of publication. If it is submitted, or in press, do indicate that but send it also - we need them all! Please fax, mail, or email your publications at any time to Nancye Wright of the [User Administration Office](#).

Members of the User community have often asked "What can we do to help the NSLS keep its funding, or get better funded?" Besides writing to your representatives in Congress and the Senate, your most important contributions to the continued health and success of the NSLS are the research you perform here, and telling us about it!

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# MARCH 1995 NSLS NEWSLETTER

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## 17th International Free Electron Laser Conference and Users' Workshop

New York Marriott Marquis, New York, New York

August 21-25, 1995

Hosted by Brookhaven National Laboratory

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The conference will cover the science and technology of free electron lasers. Areas of interest will include:

- FEL Theory
  - FEL Experiments
  - FELs Under Development
  - FEL New Concepts
  - Accelerators for FELs
  - Optical Technology for FELs
  - Undulators
- 

For information please see the [FEL Conference](#) under the NSLS News and Announcements, or contact the FEL'95 Conference Secretary:

Judith Thompson  
Brookhaven National Lab.  
Building 725B  
P.O. Box 5000  
Upton, New York 11973-5000  
Telephone: (516) 282-2145  
FAX: (516) 282-4745  
FEL95@BNLLS1.BNL.GOV

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# MARCH 1995 NSLS NEWSLETTER

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## Identification and Tagging of Equipment

Steve McAlary, NSLS Administration

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The Department of Energy requires that all capital equipment at BNL have bar codes or tags to indicate ownership. If your organization does not have tags (logo's, etc.) we will supply blank tags (see sample below).



These tags are available at the NSLS stockroom free of charge. Please obtain tags, fill in your organization in the space provided, and apply to all unidentified equipment belonging to your organization. The serial numbers on the blank tags are for your optional use in record-keeping.

BNL's Supply & Materiel Division will be conducting periodic inspections to ensure proper identification of all equipment. If, during the inspection, untagged equipment is found, a tag will be applied. If you have any questions or need assistance please call me at extension 7397.

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